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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,825	07/09/2003	Oliver Kienzle	007413-056	8138

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EXAMINER	
HASHMI, ZIA R	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/614,825	KIENZLE ET AL.	
	Examiner	Art Unit	
	Zia R. Hashmi	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/16/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-21 are rejected under U.S.C. 103(a) as being unpatentable over Hiroi et al. (US 2002/0100872 A1), in view of Todokoro et al. (6,646,262).

3. With respect to independent claims 1, 13, 18, and 20, and dependent claim 5, Hiroi et al. disclose a method and apparatus of electron-microscopic observation of a semiconductor arrangement (Abstract, lines 1-2, para 0002, lines 1-10, para 0039, lines 4-11, para 0041, and Fig. 13), comprising:

an electron microscopy optics for imaging secondary electrons emanating from the semiconductor arrangement (para 0026 and 14, 15, 5, & 20 in Fig. 27) within an extended object field on a position-sensitive detector (16 in Fig. 27), providing an illumination device for emitting a primary energy beam (paras 0026 & 0030, and 14 in Fig. 13), directing the primary energy beam to at least the object field for releasing secondary electrons from the semiconductor arrangement (5, 20 and 16 in Fig. 27), wherein the semiconductor arrangement comprises a region with an upper surface provided by a first material and a recess which is surrounded by the upper surface and has a bottom provided by a second material (paras 0004, 0005, 0054, 0081, lines 1-21,

and Fig. 1, 2A, 2B, & 7). The illumination device comprises an electron source (14 in Fig. 13, & 14 in Fig. 27), and the primary energy beam comprises a primary electron beam (5 in Fig. 13), with an adjustable kinetic energy of electrons of the primary electron beam (paras 0030,0041, 0045, and Fig. 13), wherein, dependent upon the energy of the electrons of the primary electron beam, the first material has a secondary electron yield characteristic with a maximum and a first neutral point below the maximum and a second neutral point above the maximum (Ea and Eb and neutral points on the plots for materials A and B in Fig. 1, 3 & 12), and wherein the kinetic energy of the electrons of the primary beam is adjusted to an energy value which is higher than the energy of the first neutral point of the secondary electron yield characteristic of the first material (paras 0092, lines 1-12, 0102, 0103, 0106, and Fig. 1, 7, 11, & 12). In addition, Hiroi et al. disclose provision of a memory for storing digital data (para 0105, lines 5-20).

4. With respect to claim 1-4 and 6-21, Hiori et al. fail to disclose an aspect ratio higher than 1.5 provided by a first material and the bottom. Todokoro et al., however, discloses an aspect ratio of 2 or less of a contact hole irradiated by a primary electron beam resulting in emission of a portion of secondary electrons, thereby making observation possible (col. 4, lines 22-34).

It would have been obvious to one having ordinary skill at the time of the invention was made, to combine the methods and apparatus of Hiroi and Todokoro et al., because Hiroi et al. teach (para 0004) that unless the secondary electron yield ratio

of predetermined materials A and B are different at a given acceleration voltage, an image cannot be observed, as there is little contrast.

Conclusion

5. Nagal et al. disclose (6,259,094) an electron beam inspection method and apparatus, which seems to solve the problem of maintaining constant current density while changing the beam shape, in the inspection region.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact Electronic Business Center (EBC) at 866-217-9197 (toll-free).

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zia Hashmi whose telephone number is (571) 272-2473. The examiner can normally be reached between 8.30 AM- 5 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477.

JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Zia Hashmi

January 4, 2005.